Research in International Business and Finance 36 (2016) 196–211

Contents lists available at ScienceDirect

Research in International Business and Finance

journal homepage: www.elsevier.com/locate/ribaf

Efficiency and risk convergence of Eurozone financial markets

Joerg Wild

Shanghai University of Finance and Economics, 777 Guoding Road, 200433 Shanghai, China

ARTICLE INFO

Article history:
Received 12 November 2014
Received in revised form 30 April 2015
Accepted 8 September 2015
Available online 14 September 2015

MSC:
14-10
15-01

Keywords:
Bank efficiency
Financial risk
Convergence
DEA
SFA
Eurozone

ABSTRACT

This paper discusses beta and sigma convergence of commercial, savings, and cooperative banks in the Eurozone from 1999 to 2012. For this purpose, concepts of the growth and efficiency convergence literature are consulted and GMM, fixed effects models, and OLS are applied. Convergence is analyzed by calculating two efficiency metrics – data envelopment analysis (DEA) and stochastic frontier analysis (SFA) – and two risk metrics – equity to total assets (E/TA or EQTOAS) and Z-scores (ZSCORN). For commercial banks, efficiency convergence of both metrics is found, however, savings banks show no signs of convergence and cooperative banks only show signs of SFA convergence. Banks of all three specializations show E/TA convergence, but only savings banks convergence with respect to Z-scores. Nevertheless, the EU's Single Market Program still has a long way to go to create identical conditions for all member countries' financial markets. The discovery that there are considerable differences between banks' specializations, and even more, that there is convergence with respect to E/TA as a risk metric are among the main academic contributions of this paper.

1. Introduction

A key driver of the construction of the EU was the hope to unleash the potential of a common market with respect to goods and services, as well as the introduction of a common currency. With the creation of the EMU in 1999, the euro was widely expected to become a catalyst for economic integration and convergence within Europe, not to mention a key driver of economic prosperity. In order to secure the functioning of the common market, economic and social cohesion became fundamental and has been a goal of the EU from the early beginnings. The Treaty on the Functioning of the EU already defines economic, social and territorial cohesion in the form of reducing disparities in development as one of the main operational priorities.[1] The EU commission's publication of the Commission Communication on Cohesion Policy and the Environment in 1995 can be seen as a first major milestone that led to the creation of the European Cohesion Policy.[2]

E-mail address: joerg.wild@gmail.com

[1] The TFEU also known as the Treaty of Rome (1958) is one of two principal treaties on which the EU is based with the other being the Treaty on European Union, or Maastricht Treaty, that became effective in 1993, as outlined in Part 3, Union policies and internal actions, of the TFEU deals with economic, social and territorial cohesion. Further, the treaties are enhanced with 37 protocols, 2 annexes and 65 declarations that are to elaborate the details, some are directed at specific countries, without being in the full legal text, of which Protocol 28 deals with economic, social and territorial cohesion.

[2] The identified key targets are to promote growth-enhancing conditions and reduce disparities between the levels of development of EU regions and member states in order to achieve cohesion. The objective of the European Cohesion Policy is defined in Articles 2 and 4 and Title XVII of the Treaty establishing the European Community. According to Article 2, Cohesion Policy should "promote economic and social progress as well as a high level of employment, and achieve balanced and sustainable development". Article 158 adds, "in particular, the Community aims to reduce the disparities between the levels of development of the different regions and the backwardness of the least favored regions or islands, including rural areas".

http://dx.doi.org/10.1016/j.ribaf.2015.09.015
0275-5319/

The sovereign debt crisis and, more generally, the differential macroeconomic performance across euro area members in the aftermath of the 2008–2009 recession has called into question the positive impact of the creation of a monetary union and the existence of a common economic growth development. Some commentators argued that the adoption of a common currency may have been a factor of divergence and, in particular, a source of a growing gap between a "virtuous core" and a "sinful periphery" (Estrada et al., 2013). The years of crisis have moreover underlined that the financial market should not only be viewed as a driver of growth but also a potentially destabilizing risk factor due to the interconnected structure of modern financial markets.[3]

The aim of this paper is therefore to check whether harmonization and integration among Eurozone countries' financial markets has taken place with respect to efficiency and risk. It was not until June 29, 2012 that the Euro-area leaders "affirm that it is imperative to break the vicious link between banks and sovereigns" and called for a single supervisory mechanism (SSM) under the direction of the ECB.[4] However, the SSM only directly supervises the largest and systemically relevant banks and the great majority of especially savings and cooperative banks remain under supervision of national authorities. The question under scrutiny therefore is to analyze to what degree the banking market is integrated on a Eurozone level since the creation of the monetary union.

Tests of beta and sigma convergence of financial and economic variables are conducted for 12 Eurozone countries from 1999 till 2012. Convergence rates are calculated by applying the generalized method of moments approach (GMM), a fixed effects model (FE), and an ordinary least square model (OLS) for commercial, savings, and cooperative banks. Briefly, convergence is assumed if the estimated beta is significant and negative, and at the same time, the estimated sigma – which is an indication of how fast the convergence takes place – is also significant. The application of different models allows for a general robustness check of the results. All the data is further split into a period before and after the onset of the Global Financial Crisis of 2007/2008, the pre- and post- crisis shock period, which allow for a comparison of the development of convergence.

This paper's analysis of convergence of the Eurozone's financial market contributes to the existing research in several ways: Although previous studies were dealing with convergence of efficiency of commercial banks in the EU, none has focused on checking for convergence in the Eurozone as a subset of the EU. Some studies presented inconclusive results as to whether convergence has taken place; moreover, the countries under scrutiny were generally EU15, E22 or some other random mix of European countries, whereas the following research exclusively deals with Eurozone countries to assess the progress of the Single Banking Market. Due to the higher degree of economic, regulatory and supervisory integration of the Eurozone countries compared the EU countries, convergence is of particular interest. Asynchronous shock have posed a severe risk for the cohesion of the euro area, partially as Eurozone member countries were unable to mitigate weak economic growth by the means of currency devaluation.

Although the application of convergence to bank efficiency data of commercial banks in the EU is nothing new, no previous study has included savings and cooperative banks on an international scale. Unlike the case of commercial banks for which some studies found proof of a common banking market, the existing literature has rarely included savings and commercial banks, despite the fact that banks of these specializations account for roughly 30% of the total assets of the Eurozone banking market.[5] The last study employing non-parametric efficiency measurement and tests of convergence was undertaken by Andrieş and Căpraru (2012b) for commercial banks of EU countries from 2003 to 2009.[6] The present research includes data from the inception of the euro in 1999 until 2012, thereby including the years of the Eurozone sovereign debt crisis. Valuable information is expected from results spanning over these years of financial upheaval and ensuing regulatory and economic harmonization. Moreover, the samples are divided into two sub-periods: 1999–2006, the years following the inception of the common currency and 2007–2012, marking the period before the onset of the US subprime crisis and the years of crisis, first marked by the collapse of the US housing market and followed by the sovereign debt crisis of the Eurozone. Lastly, no previous study has dealt with the conversion of financial markets with respect to risk, which is surprising, especially considering the large amount of literature focusing on efficiency and growth convergence. New insights to the functioning of financial markets are expected by the extension of convergence literature.

2. Literature review

The concept of beta and sigma convergence is directly related to the neo-classical growth theory of Solow (1956) where one key assumption is that factors of production, particularly capital, are subject to diminishing returns. Beta convergence is defined here as a process in which poorer regions grow faster than richer ones and eventually both regions reach the same level. Accordingly, the growth process should lead economies to a long-run steady-state characterized by a rate of growth

[3] Unlike prior crises, contagion following the 2008 global financial crisis is not confined to emerging markets. The U.S. as well as other mature financial markets as is the case for the Eurozone, transmit and receive contagion (Luchtenberg and Vu, 2015). Other studies conclude that contagion form the U.S. is uni-directional with respect to spot and future equity markets (Inci et al., 2011). Apart form the internationalization of equity markets, firms are nowadays also increasingly depended on market liquidity of debt (Mac an Bhaird, 2013).

[4] Source: Euro Area Summit Statement, Brussels, June 29, 2012.

[5] Status: end of 2012 figures. Commercial banks account for approx. 50% of total assets of the banking market and represent the largest homogeneous sub-population of banks. Source: BvD Bankscope, author's calculations.

[6] Andrieş and Căpraru (2012a) conducted a study on banking efficiency convergence of central and eastern European countries. As the focus of this research paper is on the Eurozone, aforementioned study appears even less relevant than Andrieş and Căpraru (2012b) in this context.